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SUMMARY OF: NEW PATTERNS OF COLLABORATION AND RIVALRY IN THE US AND EUROPEAN DEFENSE AND AEROSPACE INDUSTRIES

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by

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Summary of: New Patterns of Collaboration and Rivalry in the US and European Defense and Aerospace Industries

Presenter: Raymond (Chip) Franck, PhD, Senior Lecturer, Graduate School of Business & Public Policy, Naval Postgraduate School, retired from the Air Force in 2000 in the grade of Brigadier General after 33 years commissioned service. He served in a number of operational tours as a bomber pilot; staff positions, including the Office of Secretary of Defense and Headquarters, Strategic Air Command; and was Professor and Head, Department of Economics and Geography at the US Air Force Academy. His institutional responsibilities at NPS have included the interim chairmanship of the newly formed Systems Engineering Department from July 2002 to September 2004, teaching a variety of economics courses, and serving on a number of committees to revise curricula for both the Management and Systems Engineering disciplines. His research agenda has focused on defense acquisition practices and military innovation.

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Bernard Udis, PhD, is Professor Emeritus of Economics at the University of Colorado at Boulder and Visiting Research Professor at the US Naval Postgraduate School. He has also served as Distinguished Visiting Professor of Economics at the US Air Force Academy and as William C. Foster Fellow at the US Arms Control & Disarmament Agency. His NATO Research Fellowship examined the costs and benefits of offsets in defense trade.

Professor Udis' published work includes three books: *The Economic Consequences of Reduced Military Spending* (editor, 1973), *From Guns to Butter: Technology Organizations and Reduced Military Spending in Western Europe* (1978), and *The Challenge to European Industrial Policy: Impacts of Redirected Military Spending* (1987). In addition, he has published numerous articles in scholarly journals on defense industries and military power. These include "Offsets as Industrial Policy: Lessons from Aerospace" (with Keith Maskus, 1992), and "New Challenges to Arms Export Control: Whither Wassenaar?" (with Ron Smith, 2001). A number of his works are considered classics in defense economics and have been reprinted in collections such as *The Economics of Defence* (2001) and *ARMS TRADE, SECURITY AND CONFLICT* (2003).

Professor Udis' current research focuses upon competition and cooperation in the aerospace industries of the US and the EU.

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This is a summary of the report cited above for inclusion in the *Proceedings* of the Sixth Annual Acquisition Research Symposium hosted by NPS (May 2009). The report itself greatly exceeds the length guidelines for the *Proceedings*. The topics raised here are discussed in greater detail within the body of that report.

Summary

International defense industrial affairs are becoming increasing global and increasingly complex. This report is a continuation of the authors' efforts to provide insights and analytical frameworks useful for understanding ongoing developments in the global defense market.[1]

In this stage of that overall project, we focus primarily on defense industrial firms and their relationships with their sovereign customers—considering the organization of Boeing 787 development and production, the KC-45 aerial tanker competition, and European defense firms' direct investment in the US defense market.

Our Cases

In the 787 case (Section II), we observe that even experienced companies like Boeing can run afoul of the complexities of coordinating a multinational, multiform venture. We suspect this problem is not unique to Boeing, and will, if not satisfactorily addressed, limit the scope and success of multinational projects in the defense sector as well.

The KC-45 (Section III), at least to date, seems to illustrate a new weakness of defense establishments relative to their suppliers. The failure to successfully award a KC-45 contract to the EADS-Northrop Grumman team (after protest to the GAO) raises some troubling questions. Is it possible to award a protest-proof contract for a major defense system? Doesn't the buyer side of the US defense market more resemble a quarrelsome committee than the classic model of the sovereign monopsonist? With increasingly large, winner-take-all competitions, what's the potential for procurement gridlock—the apparent state of the KC-45? Will the concentration of buyer power (through smaller numbers) and the resultant increase in agility give suppliers exploitable advantages over their customers?

Our discussion of foreign direct investment in US defense industries focuses on three European firms: BAE, EADS and Finmeccanica (Section IV). Our research was informed in significant part through confidential interviews with high-level, Washington-based officials

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[1] Previous work by the authors includes *Echoes across the Pond* (NPS-AM-08-002). Monterey, CA: NPS, 2008.

intimately familiar with the issues at hand. The central theme of this discussion is the interplay between the motivations for these firms to enter the US defense market, the US regulatory environment (which constrains such entries), and the corporate strategies intended to work with (and around) those legal barriers.

Our discussion of these three firms suggests three interesting conclusions. First, entry into the US defense market is indeed motivated primarily by the relatively high level of the US defense budget, relative to those in Europe (consistent with prevailing conventional wisdom). Second, "Buy American" and restrictions on direct investment have proven to be penetrable—to a significant degree. Finally, a two-way street of defense industrial trade between the US and Europe appears to be emerging as fully fledged reality—after decades of heated debate and limited progress.

Conclusions

Our conclusions follow. Many are not striking (or new to us), but taken together, we feel they are significant and useful.

Complexity and cost have changed and are fundamentally changing the nature of economies of scale. Production runs that usefully exploit economies of scale and learning curves are increasingly beyond the reach of single nation-states. Accordingly, new weapon systems (such as the Joint Strike Fighter) have increasingly become international ventures—albeit with senior partners. On the supply side, defense firms have undertaken more projects featuring outsourcing arrangements and strategic partnerships. In addition, the number of first-tier defense suppliers has significantly declined.

Inter-firm relationships are much more a product of situation and project type than by the firm boundaries of more traditional thought. Even very large firms (such as Boeing and Lockheed-Martin) can compete in some areas and collaborate in others. This has contributed to the increased complexity of both the market structure and the management of major projects.

Finally, the combination of reduced numbers of suppliers and the complexity of globalized defense markets has significantly increased the market power of defense industrial suppliers relative to their (sovereign) customers. Among other things, it appears that the suppliers have been more agile in adapting to complexity than have their bureaucratic customers.

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Acquisition Management

- Acquiring Combat Capability via Public-Private Partnerships (PPPs)
- BCA: Contractor vs. Organic Growth
- Defense Industry Consolidation
- EU-US Defense Industrial Relationships
- Knowledge Value Added (KVA) + Real Options (RO) Applied to Shipyard Planning Processes
- Managing Services Supply Chain
- MOSA Contracting Implications
- Portfolio Optimization via KVA + RO
- Private Military Sector
- Software Requirements for OA
- Spiral Development
- Strategy for Defense Acquisition Research
- The Software, Hardware Asset Reuse Enterprise (SHARE) repository

Contract Management

- Commodity Sourcing Strategies
- Contracting Government Procurement Functions
- Contractors in 21st Century Combat Zone
- Joint Contingency Contracting
- Model for Optimizing Contingency Contracting Planning and Execution
- Navy Contract Writing Guide
- Past Performance in Source Selection
- Strategic Contingency Contracting
- Transforming DoD Contract Closeout
- USAF Energy Savings Performance Contracts
- USAF IT Commodity Council
- USMC Contingency Contracting

Financial Management

- Acquisitions via leasing: MPS case
- Budget Scoring
- Budgeting for Capabilities-based Planning
- Capital Budgeting for DoD

- Energy Saving Contracts/DoD Mobile Assets
- Financing DoD Budget via PPPs
- Lessons from Private Sector Capital Budgeting for DoD Acquisition Budgeting Reform
- PPPs and Government Financing
- ROI of Information Warfare Systems
- Special Termination Liability in MDAPs
- Strategic Sourcing
- Transaction Cost Economics (TCE) to Improve Cost Estimates

Human Resources

- Indefinite Reenlistment
- Individual Augmentation
- Learning Management Systems
- Moral Conduct Waivers and First-tem Attrition
- Retention
- The Navy's Selective Reenlistment Bonus (SRB) Management System
- Tuition Assistance

Logistics Management

- Analysis of LAV Depot Maintenance
- Army LOG MOD
- ASDS Product Support Analysis
- Cold-chain Logistics
- Contractors Supporting Military Operations
- Diffusion/Variability on Vendor Performance Evaluation
- Evolutionary Acquisition
- Lean Six Sigma to Reduce Costs and Improve Readiness
- Naval Aviation Maintenance and Process Improvement (2)
- Optimizing CIWS Lifecycle Support (LCS)
- Outsourcing the Pearl Harbor MK-48 Intermediate Maintenance Activity
- Pallet Management System
- PBL (4)
- Privatization-NOSL/NAWCI
- RFID (6)
- Risk Analysis for Performance-based Logistics
- R-TOC Aegis Microwave Power Tubes

- Sense-and-Respond Logistics Network
- Strategic Sourcing

Program Management

- Building Collaborative Capacity
- Business Process Reengineering (BPR) for LCS Mission Module Acquisition
- Collaborative IT Tools Leveraging Competence
- Contractor vs. Organic Support
- Knowledge, Responsibilities and Decision Rights in MDAPs
- KVA Applied to Aegis and SSDS
- Managing the Service Supply Chain
- Measuring Uncertainty in Earned Value
- Organizational Modeling and Simulation
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Defense Acquisition in Transition

6TH ANNUAL ACQUISITION RESEARCH SYMPOSIUM

New Patterns of Collaboration and Rivalry in the US and European Defense and Aerospace Industries

Raymond Franck, Ira Lewis, Bernard Udis

Naval Postgraduate School

PANEL 17, 14 MAY 2009

PART OF A CONTINUING EFFORT TO UNDERSTAND AN INCREASINGLY COMPLEX ENVIRONMENT

- FY07/08: “Echoes across the Pond: Understanding EU-US Defense Industrial Relationships” (last year’s Symposium)
- FY08: “New Patterns of Rivalry and Collaboration in the US and European Defense and Aerospace Industries” (today)
- FY09: “Global Cooperation and Competition in the Defense and Aerospace Industries” (in progress)

OUTLINE

- INTRODUCTION
- BOEING 787
- KC-45 COMPETITION
- FOREIGN DIRECT INVESTMENT IN US DEFENSE MARKET
  - BAE
  - EADS
  - FINMECANICA
- SOME CONCLUDING THOUGHTS

BOEING 787: an Extrapolation From the B777 Project

CONTEXT: THE B-777 SUCCESS

- CARBON FIBER REINFORCED PLASTIC (CFRP)
- EXTENSIVE OUTSOURCING
- "PAPERLESS" DESIGN

B-787, A NEW TYPE

- EXTENSIVE USE OF COMPOSITES (CFRP)
- INCREASED FUEL EFFICIENCY (~20%)
- PASSENGER AMENITIES
  – HIGHER HUMIDITY
  – LARGER WINDOWS
- EVEN MORE OUTSOURCING
  – 70% OF AIRFRAME
  – … WITH 30 TIER 1 SUPPLIERS
  – METHOD OF SHARING RISK
- COMMERCIAL SUCCESS, MEASURED BY INITIAL ORDERS

SUPPLY CHAIN PROBLEMS

- RELIED ON PAST RECORD OF "TRUSTED RELATIONSHIPS" WITH SUPPLIERS
- FAST-PACED PROGRAMS
- INSUFFICIENT MONITORING
- DELAYS FOR FIXING

➔MID-PROJECT VERTICAL INTEGRATION

  – SOME ASSEMBLY AND SYSTEMS INTEGRATION FUNCTIONS RETURN TO BOEING

- BENEFITS NONETHELESS, SUCH AS FACILITATING INNOVATION IN LOWER TIERS

IMPLICATIONS FOR DOD

- GLOBALIZATION AS FACT
- CONTINUING IMPORTANCE OF BEING A KNOWLEDGEABLE CUSTOMER
  - … FOR BOTH INTERMEDIATE AND FINAL PRODUCTS
  - … WITH IMPLICATIONS FOR HUMAN CAPITAL POLICY
- EMULATING SUCCESSFUL “COMMERCIAL PRACTICES” IS NO PANACEA
  - E.G., BETTER TO HAVE EMULATED TOYOTA THAN EXTRAPOLATED FROM THE 777 PROJECT

KC-45 CONTEXT

- AERIAL REFUELING AS A CORE COMPETENCE … *SINE QUA NON* OF POWER PROJECTION
- AGING OF KC-135 FLEET
  - RISKS OF HIGH COSTS, LOW AVAILABILITY
  - ILLUSTRATED BY CURRENT KC-135Es
- KC-767 LEASING OPTION
  - STARTING RECAPITALIZATION
  - HEDGE AGAINST KC-135 FAILURE
  - … A RATHER BIZARRE ENDING

“KC-X” COMPETITION

- “Key Performance Parameters”, AND “Best Value”
- FINAL RFP, 31 JAN 2007
  - NG-EADS OBJECTION TO ORIGINAL RFP
- EXTENSIVE PUBLICITY, LOBBYING CAMPAIGNS
  - TO INCLUDE A KC-30 OFFSET PACKAGE
- AWARD TO KC-30, 29 FEB 08 … CLOSE

BOEING’S PROTEST, 11 MAR 08 … SUSTAINED

- GROUNDS FOR PROTEST INCLUDED …
  - WEIGHTING OF “EXTRA” FUEL AND PASSENGER CAPACITY
  - EVALUATION OF RISKS
  - COST ASSESSMENTS
  - EFFECTS OF BASING CHARACTERISTICS (ESPECIALLY RAMP SPACE NEEDS)
- SUSTAINED BY GAO, 18 JUN 08
  - “SUBSTANTIAL,” SIGNIFICANT ERRORS
  - SEEMED TO GO BEYOND KEY BOEING ALLEGATIONS

ABORTIVE NEW COMPETITION

- "AMENDMENTS AND CLARIFICATIONS" TO RFP ISSUED, 6 AUG 08 … WITH SOURCE SELECTION LATE 2008
- BOEING THREATENS TO PULL OUT … INSUFFICIENT TIME FOR COMPETITIVE PROPOSAL
- UPDATE: COMPETITION SLIPPED
- CURRENT STATE: MULTIPLE VETO HOLDERS … GRIDLOCK?

SOME HYPOTHESES, AS QUESTIONS

- ARE PROTESTS INEVITABLE?
  - VERY SMALL NUMBER OF LARGE, WINNER-TAKES-ALL COMPETITIONS
- IS A PROTEST-PROOF SELECTION CONSISTENTLY ACHIEVEABLE?
  - COULD NG-EADS HAVE SUCCESSFULLY PROTESTED AN AWARD TO BOEING?
  - IS “PERFECTO” CONSISTENTLY DOABLE?
- SHOULD WE RECONSIDER THE STANDARD MODEL?
  - SOVEREIGN MONOPSONIST VS. COMPETITORS
  - QUARRELSOME COMMITTEE VS. AGILE OLIGOPOLISTS

RECOMMENDATIONS

- RESOLVING THE KC-45 GRIDLOCK
  - DUAL SOURCING?
  - OUT-OF-COURT SETTLEMENT?
- GLEANING LESSONS LEARNED
  - FORENSIC CASE STUDY … THAT GOES BEYOND AIR FORCE LESSONS LEARNED EXERCISE
  - … LOOKING FOR MULTIPLE CAUSES AND SYSTEMIC FAILURES
- UNDERSTAND THAT MAJOR SOURCE SELECTIONS ARE INDUSTRIAL POLICY MEASURES

FOREIGN DIRECT INVESTMENT IN US DEFENSE INDUSTRIES

- LEGISLATIVE AND REGULATORY FRAMEWORK
- THREE CASES: anonymous interviews
  - EADS
  - FINMECCANICA
  - BAE
- SOME OBSERVATIONS

LEGISLATIVE & REGULATORY FRAMEWORK

- WWI: SEIZURE OF GERMAN ASSETS, ON NATIONAL SECURITY GROUNDS
- TRADING WITH ENEMY ACT (TWTE) ALSO APPLIED IN WWII
- REVIEW COMMITTEE (CFIUS) ESTABLISHED 1975
- TWTE AMENDED IN 1977
- SUBSTANTIAL TWO-WAY FDI FOR US (ESPECIALLY 1980s AND BEYOND)

Legislative & Regulatory Framework (cont)

- EXON-FLORIO AMENDMENT (1988)
  - STRUCTURE FOR CFIUS REVIEWS
  - … WITH BROAD MANDATE
- BYRD AMENDMENT (1992)
  - MOTIVATED BY CSF-THOMSON’S PROPOSED ACQUISITION OF LTV
- FOREIGN INVESTMENT AND NATIONAL SECURITY ACT (FINSA, 2007)

EADS (European Aeronautic Defence and Space Company)

- EADS' North American Business Lines: aerial tankers, rotorcraft, transport aircraft, defense electronics, space
- INTERVIEW COMMENTS
  - SUPERIORITY OF A330 VS. B767
  - FACILITIES FOR KC-30 ASSEMBLY
  - EADS AS GLOBAL COMPANY
  - ABILITY TO SATISFY ITAR REQUIREMENTS

EADS STRATEGEMS

- LEAD WITH OFFSETS (relabeled if needed)
  - CUSTOMER HAS RIGHT TO "DOMESTIC RETURN" FROM FOREIGN PRODUCTS
  - … WITH A MAJORITY OF US CONTENT
- ADAPTING TO THE MARKET
  - ENTRY TO THE DOLLAR AREA
  - US PARTNERS (SUCH AS NG) TO PROVIDE "FIREWALLS" FOR SATISFYING US TECHNOLOGY REGULATIONS

FINMECCANICA

- CORPORATE STRATEGY BASED ON ALLIANCES WITH OTHER FIRMS
- VIEW OF NORTH AMERICA
  - OFFSETS DON'T RULE; QUALITY DOES
  - RIPE FOR INVASION
    - US FIRMS OVERLY DEPENDENT ON DOD's FMS STRUCTURE ABROAD AND SIZE OF DOMESTIC MARKET
    - AGING WORK FORCES
    - ADAPTED TO HIGHLY BUREAUCRATIC PROCESSES
  - ITAR OBJECTIONABLE, FOR A NUMBER OF REASONS

→ AGILE NICHE PLAYERS CAN THRIVE

BAE SYSTEMS

- REINCARNATION OF GENERAL DYNAMICS?
  - AGGRESSIVE ACQUISITION STRATEGY … PREFERABLY SUCCESSFUL US FIRMS
  - …FOR GROWTH AND DIVERSIFICATION "TO MEET THE NEEDS OF ALL MILITARY SERVICES"
- OFFSETS RULE: "necessary to focus on creating jobs"
- LOOKING LIKE AN AMERICAN COMPANY
  - BOARD OF DIRECTORS
  - COMPLIANCE WITH SECURITY REGIME
  - PLAYING THE POLITICAL GAME

THOUGHTS ON THE "CASES"

- WHAT MAKES US MARKET ATTRACTIVE?
  - PUSH: THE EXPORT IMPERATIVE
  - PULL: US DEFENSE MARKET; PROSPECTS OF US PARTNERS
- OVERCOMING OBSTACLES?
  - WORKING AROUND REGULATORY BARRIERS
  - PRODUCTION FACILITIES IN US
  - FINDING GOOD NICHES
- A REAL TWO-WAY STREET?

CLOSING THOUGHTS FOR THE REPORT

- DEFENSE INDUSTRY INCREASINGLY INTERNATIONAL, AND INCREASINGLY COMPLEX (NOT ORIGINAL)
- INCREASING SIZE (AND RISK) OF PROJECTS -- RELATIVE TO SIZE OF FIRMS
- RISE OF “CO-OPETITION”

(MORE) CLOSING THOUGHTS

- RISE OF THE FIRM, AT EXPENSE OF THE "SOVEREIGN" CUSTOMER?
- PROBLEMS FOR DEFENSE ESTABLISHMENTS
  - ADAPTING THE BUREAUCRACY TO THE NEW ENVIRONMENT – INDUSTRIAL AND MILITARY AFFAIRS
  - BEING A FULLY KNOWLEDGEABLE CUSTOMER